Effect of Rolling Method and Low-temperature Annealing on the Structure of Cold-rolled α-Brass

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Effect of Rolling Method and Low-temperature Annealing on the Structure of Cold-rolled α-Brass*

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Abstract

The change in structures produced by three types of rolling method (straight-, reverse- and cross-rolling) and the change in the structures due to low-temperature annealing were investigated into with samples of 70/30 brass having different grain-sizes (fine and coarse), and were discussed in relation to the change in hardness previously reported. At the rolling reduction of 40%, strainght- or reverse-rolling gave a structure an inhomogeneity of deformation in some grains (in the case of fine-grained specimen) or with in each grain (in the case of coarse-grained specimen). On the other hand, cross-rolling produced a comparatively uniform structure with conjugate slip. At the high reduction of 80%, a rolled structure seemed to be characterized by the remarkable development of flaw-like deformation markings. The structure was more complex in the fine-grained and cross-rolled specimens than in the others. The change in structure by annealing at 200°C was observed as diffuse or faint etched figures in the first stage of hardening and as a development of a kind of polygonization in the second stage of hardening. The latter was thought to contribute to the intermediate stage of softening between the first and the second stage of hardening. After those stages, nucleation by recrystallization gradually proceeded in accordance with the development degree of deformation structure.

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